

Schizophrenia Research



At the National Institute of Mental Health

FACT SHEET

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Schizophrenia, the most chronic and disabling of the severe mental disorders, is a major focus of research at the National Institute of Mental Health (NIMH), the world's foremost mental health scientific organization. This Federal agency takes the lead in neuroscientific investigation devoted to understanding the causes, diagnosis, prevention, and treatment of schizophrenia and other mental disorders, which afflict millions of Americans.

Since the Institute's inception 50 years ago, much has been learned about mental disorders and their effects on the brain. Revolutionary scientific advances in neuroscience, molecular biology, genetics, and brain imaging have provided some of the greatest insights into the complex organ that is the seat of thought, memory, and emotion. Thanks to these new tools, the scientific evidence that mental illnesses are brain disorders now exists.

More than 2 million Americans are affected by schizophrenia. The illness, which may impair a person's ability to manage emotions, interact with others, and think clearly, typically develops in the late teens or early twenties. Symptoms include hallucinations, delusions, disordered thinking, and social withdrawal. Most people with schizophrenia continue to suffer chronically or episodically throughout their lives. Even between bouts of active illness, lost opportunities for careers and relationships, stigma, residual symptoms, and medication side effects often plague those with the illness. One of every 10 people with schizophrenia eventually commits suicide.

During the last decade, NIMH research has led to dramatic advances in the treatment of schizophrenia—primarily in the development of several new medications with fewer side effects. However, some

An NIMH Snapshot

The National Institute of Mental Health (NIMH) is one of 25 components of the National Institutes of Health (NIH), the Government's principal biomedical and behavioral research agency. NIH is part of the U.S. Department of Health and Human Services. The actual total fiscal year 1999 NIMH budget was \$859 million.

NIMH Mission

To reduce the burden of mental illness through research on mind, brain, and behavior.

How Does the Institute Carry Out Its Mission?

- NIMH conducts research on mental disorders and the underlying basic science of brain and behavior.
- NIMH supports research on these topics at universities and hospitals around the United States.
- NIMH collects, analyzes, and disseminates information on the causes, occurrence, and treatment of mental illnesses.
- NIMH supports the training of more than 1,000 scientists to carry out basic and clinical research.
- NIMH communicates information to scientists, the public, the news media, and primary care and mental health professionals about mental illnesses, the brain, mental health, and research in these areas.

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symptoms, such as social withdrawal and loss of motivation, are still insufficiently treated by the new drugs. Studies are continuing to determine how these and other promising medications interact with specific neurotransmitter systems in the brain and to ascertain which drugs work best for which people. In addition, a large-scale community study has shown that less than half of patients with schizophrenia receive appropriate treatment-medication doses may have been incorrect and there was often inadequate use of psychosocial, vocational, and family therapies.

As the search for better treatments and ways to transfer those treatments to clinical practice continues, NIMH is harnessing the most sophisticated scientific tools available to determine the causes of schizophrenia. This brain disorder, like heart disease or diabetes, is complex and likely results from the interplay of genetic, behavioral, developmental, and other factors. There is an active search on several levels for the specific risk factors that may lead to schizophrenia.

Many years of family studies indicate that a vulnerability to schizophrenia is inherited. Still, scientists do not know how many genes are involved in this complex disorder, how the genetic predisposition is transmitted, or how behaviors or other events may interact with a genetic vulnerability to trigger the disorder. But an arsenal of new molecular tools and modern statistical analyses are allowing researchers to close in on particular genes that might make people more susceptible to schizophrenia by affecting, for example, brain development or neurotransmitter systems governing brain functioning.

On another research front, investigators supported by NIMH are using state-of-the-art imaging techniques to study the living brain. They have recently

discovered specific, subtle abnormalities in the structure and function of the brains of patients with schizophrenia that may provide new insights into the origins of the disease. In other imaging studies, scientists have found evidence of early biochemical changes that may precede the onset of disease symptoms, prompting examination of the neural circuits that are most likely to be involved in producing those symptoms.

Research evidence from developmental neurobiologists suggests that schizophrenia may result when neurons form inappropriate connections during fetal development.

Schizophrenia Medications

Thanks to NIMH research, a number of new antipsychotic drugs, "atypical antipsychotics," have been introduced since 1990. The first, clozapine (Clozaril®), is more effective than older antipsychotics, although it has possible severe side effects, such as agranulocytosis—a loss of white blood cells that fight infection—that require patients to be frequently monitored with blood tests. The newer atypical medications, such as risperidone (Risperdal®), quetiapine (Seroquel®), and olanzapine (Zyprexa®), are safer than the older drugs or clozapine and have fewer side effects, so they may be better tolerated by patients. NIMH is supporting clinical trials to further understand the role of atypical antipsychotics in treating schizophrenia.

Although a defect may be present at birth, it may lie dormant until puberty, a time when significant nerve cell reorganization occurs in the brain. This research has spurred efforts to identify prenatal factors, including infections in utero, that may affect development.

The Broad NIMH Research Program

In addition to schizophrenia, NIMH supports and conducts a broad based, multi-disciplinary program of scientific inquiry aimed at improving the diagnosis, prevention, and treatment of other mental disorders. These illnesses include manic-depressive illness, clinical depression, panic disorder, and obsessive-compulsive disorder.

Increasingly, the public as well as health care professionals are recognizing these disorders as real and treatable medical illnesses of the brain. Still, there is a need for more research that examines in greater depth the relationships among genetic, behavioral, developmental, social, and other factors to find the causes of these illnesses. NIMH is meeting this need through a series of research initiatives.

- **NIMH Human Genetics Initiative**

This project has compiled the world's largest registry of families affected by schizophrenia, manic-depressive illness, and Alzheimer's disease. Scientists are able to examine the genetic material of these family members with the aim of pinpointing genes involved in the diseases.

- **Human Brain Project**

This multi-agency effort is using state-of-the-art computer science technologies to organize the immense amount of data being generated through neuroscience and related disciplines, and to make this information readily accessible for simultaneous study by interested researchers.

- **Prevention Research Initiative**

Prevention efforts seek to understand the development and expression of mental illness throughout life so that appropriate interventions can be found and applied at multiple points during the course of ill-

ness. Recent advances in biomedical, behavioral, and cognitive sciences have led NIMH to formulate a new plan that marries these sciences to prevention efforts.

While the definition of prevention will broaden, the aims of research will become more precise and targeted.

More Than 2,000 Grants and Contracts

In total, NIMH supports more than 2,000 research grants and contracts at universities and other institutions across the nation and overseas. It also conducts basic research and clinical studies involving 9,000 patient visits per year at its own facilities on the National Institutes of Health campus in Bethesda, MD, and elsewhere. NIMH research projects focus on:

- basic research on behavior, emotion, and cognition to provide a knowledge base for a better understanding of mental illnesses
- basic sciences, including cellular and molecular biology, developmental neurobiology, neurochemistry, neurogenetics, and neuropharmacology, to provide essential information about the anatomical and chemical basis of brain function and brain disorders
- neuroscience and behavioral aspects of acquired immune deficiency syndrome (AIDS) and behavioral strategies to reduce the spread of HIV (human immunodeficiency virus)
- interventions to treat, prevent, and reduce the frequency of mental disorders and their disabling consequences
- mental health services research, including mental health economics and improved methods of services delivery
- co-morbidity among mental disorders and with substance abuse and other

medical conditions, such as depression and heart disease

- the prevalence of mental disorders
- risk factors for mental disorders

NIMH Research Divisions

- Division of Neuroscience and Basic Behavioral Science
- Division of Services and Intervention Research
- Division of Mental Disorders, Behavioral Research and AIDS
- Division of Intramural Research Programs

NIMH Intramural Research Program

The NIMH Division of Intramural Research Program (DIRP) encompasses a broad array of research activities that range from clinical investigation into the diagnosis, treatment, and prevention of mental illness to basic neuroscience studies conducted at the behavioral, systems, cellular, and molecular levels. DIRP is composed of more than 500 scientists working in 22 clinical branches and basic research laboratories, as well as four free-standing specialized research groups. Intramural research is conducted under the leadership of the Office of the Scientific Director.

- differences in mental health and mental illness among special populations
- children and adolescents who suffer from or who are at risk for serious mental disorders and learning disabilities
- psychotherapies and pharmacotherapies for specific disorders

At the beginning of the 21st century, NIMH stands poised to surmount the burden, loss, and tragedy of mental illnesses that afflict millions of Americans.

For More Information About NIMH

- The Office of Communications and Public Liaison carries out educational activities and publishes and distributes research reports, press releases, fact sheets, and publications intended for researchers, health care providers, and the general public. A publications list may be obtained on the web at <http://www.nimh.nih.gov/publist/puborder.cfm> or by contacting:

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Anxiety Disorders Information:
1-88-88-ANXIETY

Depression Information: 1-800-421-4211

- Information about research opportunities at the NIMH Intramural Research Program may be obtained from:

Office of the Scientific Director, NIMH
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- Information for scientists on NIMH grants and contracts programs, including grant application and review, Requests for Applications, Requests for Proposals, program announcements, research training and career development, small business programs, program analyses of NIMH extramural research grants and applications, access to NIH Grants policy, and other material may be obtained from the NIMH home page: www.nimh.nih.gov.

Schizophrenia Bulletin

NIMH publishes a quarterly scientific journal, the Schizophrenia Bulletin, which covers all aspects of schizophrenia research and treatment. In a recent poll, the *Bulletin* was ranked 3rd out of 68 psychiatric journals in scientific impact by the Social Science Citations Index - a particularly remarkable feat given the small number of annual issues and the focus on a single illness. To subscribe, contact:

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